

1923

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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH ADMINISTRATION
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

Division of Forest Insect Investigations

Hemlock Looper Situation on the Grays River
area in Washington, January 1953

by

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March 19, 1953

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SUMMARY

The regional forest insect survey of 1952 disclosed a light infestation of the hemlock looper on some 2000 acres in the Grays River drainage of Southwestern Washington.

In January 1953 a total of 60 samples was taken on two representative areas to determine the abundance of the overwintering looper eggs. The method of taking the samples and making the egg counts is described.

The looper was found to be present in greater than normal numbers, but control measures to prevent tree killing in 1953 will not be necessary. The outbreak should be watched to detect any aggressive upward trend.

REPORT

Introduction

An outbreak of the hemlock looper near Grays River in Southwestern Washington was detected on September 10, 1952 during the course of the aerial forest insect survey (See attached map). This infestation which extends over some 2000 acres is largely located within Township 9 North; Ranges 7 and 8 West. This area was logged in the early days and now supports a good stand of second growth hemlock much of which is approaching maturity.

The defoliation recorded during the aerial survey was of about the minimum intensity that can be detected from the air. In order to check the aerial observation and to determine with certainty the responsible insect, the center was ground-checked on October 2, 1952. Feeding by the looper was found to have been very light resulting in little damage to the stand. At the time of the ground examination the insect was in the adult or moth stage. Small numbers of the moths were observed fluttering about. Whenever a sapling was struck a sharp blow with an axe two or three moths would flutter out from the foliage.

In view of the light feeding and small numbers of moths present it was felt that there was little likelihood of serious defoliation by the looper during 1953. However, because of the known destructiveness of the insect, it was deemed advisable to obtain additional information on the status of the population by determining the abundance of the overwintering eggs.

The Egg Stage

The eggs are iridescent and range in color from light grey-green to dark brown. There is a characteristic impression in one end. The looper eggs can be readily distinguished from the eggs of other insects in the coastal hemlock forests. The eggs are laid singly and adhere to the surfaces on which they are deposited. Some eggs are laid on the bark, limbs and foliage but the majority are laid on moss and lichens attached to tree trunks and limbs. Recently Canadian entomologists have found that a high percentage of the eggs are deposited in the lower half of the tree crown.

Field Sampling Procedure

In the past, the sampling of looper eggs at each sampling point usually consisted of collecting an estimated 10 lineal feet of moss 3 to 4 inches in width from tree trunks, reproduction and bushes which were within arms reach of a person standing on the ground. A number of these 10-foot samples were taken on an infested area, the exact number depending upon the size of the area.

To more accurately appraise the situation on the Grays River area, it was felt desirable to collect from both the ground and tree crowns. Because of the suspected light degree of infestation it was decided to increase the size of the sample and the intensity of sampling. The individual samples were increased from 10 to approximately 30 linear feet of moss.

On January 12, 1953, Mr. Don Baisinger of the Crown Zellerbach Corporation, on whose lands the majority of the infestation is located, and the writer proceeded to Cathlamet, Washington where we were joined by Mr. Dean Prater also of the Crown Zellerbach Corporation. Mr. Prater had made arrangements for a timber faller, Mr. Glen Bjorge, to accompany us with a power saw.

The first group of 30 samples was secured from the western portion of Section 1; T9N; R3W. Fifteen trees, ranging from 16 to 28 inches D.B.H., were felled and one sample was collected from the lower crown of each tree. One ground sample was collected from the immediate vicinity of each tree.

The following day we were joined by Mr. William Christy also of the Crown Zellerbach Corporation, and Mr. Vaughn McCowan of the Weyerhaeuser Timber Company. A duplicate set of 30 samples was collected from Section 6; T9N; R7W. It is believed that the two locations from which the 60 samples were collected are typical of the infested area.

Process of Counting Eggs

On Wednesday, January 14 the bundles of wet moss were taken to Room 8, U. S. Court House in Portland where the contents were spread out on the floor to dry. An oscillating electric fan was used to keep the air of the room in circulation to hasten drying. On Friday, January 16, all samples were turned over to enable the underside to dry. By the following Monday, January 19, about half of the samples were dry and ready to process.

The method used to recover the looper eggs was developed at the Portland Laboratory during 1945 and consists of the following operations. Bit by bit the dry moss is rubbed by hand on an ordinary washboard in a tub to dislodge the looper eggs. The resulting pulverized moss is then sifted through three successively finer screens (14, 18 and 22 mesh per inch) to remove the coarse material. The last screen is the smallest mesh that will permit the free passage of the looper eggs. The rubbing and sifting process is very dusty, necessitating the use of respirators to protect the operators.

The fine screenings were then run through a machine called a Bates Laboratory Aspirator which was borrowed from the Grain Branch of the U. S. Production and Marketing Administration. This device employs air suction which can be adjusted to the degree desired. When the material to be processed is passed through this machine, the light particles are sucked out and lodged in one container while the heavier particles, including the looper eggs, fall into another container. Each sample usually yields from one to three or more table-spoonfuls of the coarse residue. It is then necessary to examine this material under a microscope to separate the looper eggs from the residue and associated insect eggs. It required four days to process the 60 bundles of moss and count the eggs.

The following personnel participated in the processing: Don Baisinger and Richard Zimmerman of the Crown Zellerbach Corporation, and J. M. Whiteside and the writer of the laboratory.

Results of Egg Counts

The detailed results of samplings are given in Table 1 in the Appendix. The generalized findings by sampling areas are as follows:

Section 1; T9N, R8W - The 15 ground samples yielded 44 eggs. Counts per sample ranged from 0 to 6 with an average of 2.9. A total of 92 eggs were extracted from the 15 crown samples. Eggs per sample ranged from 1 to 21 with an average of 6.1.

Section 6; T9N, R7W - Seventy-two eggs were recovered from the 15 ground samples. Counts ranged from 1 to 9 with an average of 4.8 per sample. The 15 crown samples produced 165 eggs. Individual counts ranged from 2 to 27 per sample with an average of 11.

Crown samples at both collection points yielded more eggs than the ground samples. The combined totals of the 30 ground samples amounted to 116 eggs, while the 30 crown samples yielded a total of 257 eggs, or more than twice as many as the ground samples.

As no previous sampling of looper eggs deposited in tree crowns has been done in this region, there is no basis for evaluating the present data on the abundance of eggs in the tree crown. Ground sampling, however, was extensively used early in 1945 to evaluate the population of an aggressive looper epidemic in Clatsop County, Oregon. This outbreak was brought under control later in the season by aerial spraying. A comparison of the numbers of eggs obtained from ground samples taken at Grays River, Washington in 1953 and in Clatsop County, Oregon in 1945 is as follows:

Location :	Grays River, Washington		Clatsop County, Oregon		
of	1953		1945		
Infestation:					
Degree of :					
Defoliation:	<u>Very Light</u>	<u>Light</u>	<u>Moderate</u>	<u>Heavy</u>	
No. of Samples:	30	19	24	21	
Total No. Eggs:	116	756	1599	715	
Average No. Eggs					
per Sample :	4	40	67	34	
Range in No. Eggs					
per Sample :	0 to 9	0 to 179	0 to 194	0 to 193	

In considering the above data, it should be recognized that the individual samples at Grays River were approximately 3 times as large as those in Clatsop County. Thus the comparative abundance of eggs at Grays River is even less than the table would indicate. It is evident from the egg counts that the looper population on the Grays River area is still quite low.

Conclusions

The sampling of the hemlock looper population in the egg stage substantiate the aerial survey findings on the Grays River area, as follows:

(1) The looper is present in greater than normal numbers, but (2) there is little likelihood of its causing appreciable tree killing in 1953.

The current trend of infestation is considered to be slightly upward. Some increases in the size and intensity of the outbreaks may be expected, but control to prevent tree killing will not be necessary in 1953. Because of the proven destructiveness of the looper, the Grays River area should be carefully watched to detect any aggressive upward trend in the infestation.

APPENDIX

Table 1 - Summary of Egg Counts on Grays River Area, Washington
January, 1953

Sample Number	Sec. 1, T9N: R8W		Sec. 6, T9N: R7W	
	No. of Eggs		No. of Eggs	
	Per Sample		Per Sample	
	Trees	Ground	Trees	Ground
1	11	5	6	3
2	5	3	3	2
3	3	1	8	4
4	8	3	21	5
5	3	1	17	7
6	2	0	20	8
7	2	3	27	8
8	21	2	9	4
9	5	5	10	9
10	10	5	4	1
11	9	4	4	3
12	7	5	2	1
13	2	1	3	2
14	1	0	24	9
15	3	6	7	6
Total Eggs	92	44	165	72
Average Per Sample	6.1	2.9	11.0	4.8